

AB1
(A2) a second polyhydroxystyrene resin having phenolic hydroxyl groups a part of which are substituted for the hydrogen atoms thereof by acid-dissociable groups selected from the group consistent of tertiary alkoxycarbonyl groups, tertiary alkyl groups and cyclic ether groups, and wherein the weight proportion of the first polyhydroxystyrene resin (A1) to the second polyhydroxystyrene resin (A2) is in range from 2:8 to 9:1;

(B) from 1 to 20 parts by weight of a radiation-sensitive acid-generating compound;

(C) from 0.1 to 25 parts by weight of a polyvinyl ether compound susceptible to crosslinking;

(D) from 0.01 to 5 parts by weight of a carboxylic acid consisting of atoms of carbon, oxygen and hydrogen alone; and

(E) from 0.01 to 1 part by weight of an amine compound.

11. (Amended) A method for the formation of a patterned resist layer on the surface of a substrate which comprises the steps of:

A2
(a) coating the surface of a substrate with the positive-working photoresist composition which comprises, as a uniform solution in an organic solvent:

(A) 100 parts by weight of a hydroxystyrene-based polymer having phenolic hydroxyl groups or carboxyl groups as a resinous base ingredient of which at least a part of the phenolic hydroxyl groups or carboxyl groups are substituted for the hydrogen atoms thereof by acid-dissociable groups;

(B) from 1 to 20 parts by weight of a radiation-sensitive acid-generating compound;

(C) from 0.1 to 25 parts by weight of a polyvinyl ether compound susceptible to crosslinking;

(D) from 0.01 to 5 parts by weight of a carboxylic acid consisting of atoms of carbon, oxygen and hydrogen alone; and

(E) from 0.01 to 1 part by weight of an amine compound;

followed by drying to form a dried photoresist layer;

(b) exposing the dried photoresist layer on the substrate surface pattern-wise to light to form a latent image of the pattern;

(c) subjecting the photoresist layer after pattern-wise light exposure to a heat treatment;

2 (d) subjecting the photoresist layer to a development treatment with an aqueous alkaline solution as a developer to form a patterned resist layer; and

(e) subjecting the patterned resist layer to a heat treatment to effect diminution of the pattern size by thermal flow of the resist layer.
